Multiple Choice Questions 61-70 for Lesson 7

1. A discrete model the predator-prey system is
   (a). \(y_{k+1} - y^k = dt*k*y^k\) and \(x_{k+1} - x^k = dt*c*y^k\)
   (b). \(y_{k+1} - y^k = dt*c*y^k\) and \(x_{k+1} - x^k = dt*(b - d)*y^k\)
   (c). \(y'(t) = k(M - y)\) and \(y_{k+1} - y^k = dt*c*(M - y^k)*y^k\)
   (d). \(y'(t) = (b - cx)y\) and \(x' = (ey - d)x\)
   (e). \(y_{k+1} - y^k = dt*(b - c*x^k)*y^k\) and \(x_{k+1} - x^k = dt*(ey - d)*x^k\)

2. A continuous modes for a predator prey system is
   (a). \(y_{k+1} - y^k = dt*k*y^k\) and \(x_{k+1} - x^k = dt*c*y^k\)
   (b). \(y_{k+1} - y^k = dt*c*y^k\) and \(x_{k+1} - x^k = dt*(b - d)*y^k\)
   (c). \(y'(t) = k(M - y)\) and \(y_{k+1} - y^k = dt*c*(M - y^k)*y^k\)
   (d). \(y'(t) = (b - cx)y\) and \(x' = (ey - d)x\)
   (e). \(y_{k+1} - y^k = dt*(b - c*x^k)*y^k\) and \(x_{k+1} - x^k = dt*(ey - d)*x^k\)

3. The steady state solution(s) \(y'(t) = (b - cx)y\) and \(x' = (ey - d)x\)
   (a). do not exist
   (b). \(y = 0\) and \(x = 0\)
   (c). \(y = d/e\) and \(x = b/c\)
   (d). \(y = 0\) and \(y = d/e\)
   (e). (b) and (c)

4. The ypfile \(y'(t) = (b - cx)y\) and \(x' = (ey - d)x\)
   (a). ypfile(1) = \((b - c*y(1))*y(2)\)
   (b). ypfile(2) = \((e*y(2) - d)*y(1)\)
   (c). \(y(1) = \) rabbits (prey) and \(y(2) = \) foxes (predator)
   (d). \(y(2) = \) rabbits (prey) and \(y(1) = \) foxes (predator)
   (e). (a), (b) and (d)

5. For \(y'(t) = (b - cx)y\) and \(x' = (ey - d)x\)
   (a). \(x\) is the fox population and \(y\) is the rabbit population
   (b). \(y\) is the fox population and \(x\) is the rabbit population
   (c). \(x\) is the predator population and \(y\) is the prey population
   (d). both \(x\) and \(y\) are predators
   (e). (a) and (c)
6. The initial array in rf.m for the predator-prey system must
   (a). have the form \( y_0 = [1 -7] \)
   (b). have the form \( y_0 = [1 7] \)
   (c). be \((1, 7)\)
   (d). \( y_0 = [1] \)
   (e). \( y_0 = [7] \)

7. The output \([t \ y]\) in rf.m for the predator-prey system is
   (a). two column vectors
   (b). two numbers
   (c). three numbers
   (d). an nx3 array
   (e). an nx4 array

8. The output \([t \ y]\) in rft.m for the predator with two prey is
   (a). two numbers
   (b). two columns
   (c). an nx3 array where \(n\) is fixed
   (d). an nx4 array where \(n\) is may vary
   (e). three columns

9. The graphical output in rft.m for the predator with two prey
   (a). has no such output
   (b). has many oscillations
   (c). does not level off as time increases
   (d). may be represented by three curves versus time
   (e). goes off to +/- infinity

10. The initial array in rft.m for the predator with two prey
    (a). have the form \( y_0 = [1 -7 10] \)
    (b). have the form \( y_0 = [1 7 10] \)
    (c). be \((1, 7, 10)\)
    (d). \( y_0 = [1], y_1 = [7] \) and \( y_2 = 10 \)
    (e). \( y(1) = 1, y(2) = 7 \) and \( y(3) = 10 \)